FIG. 1

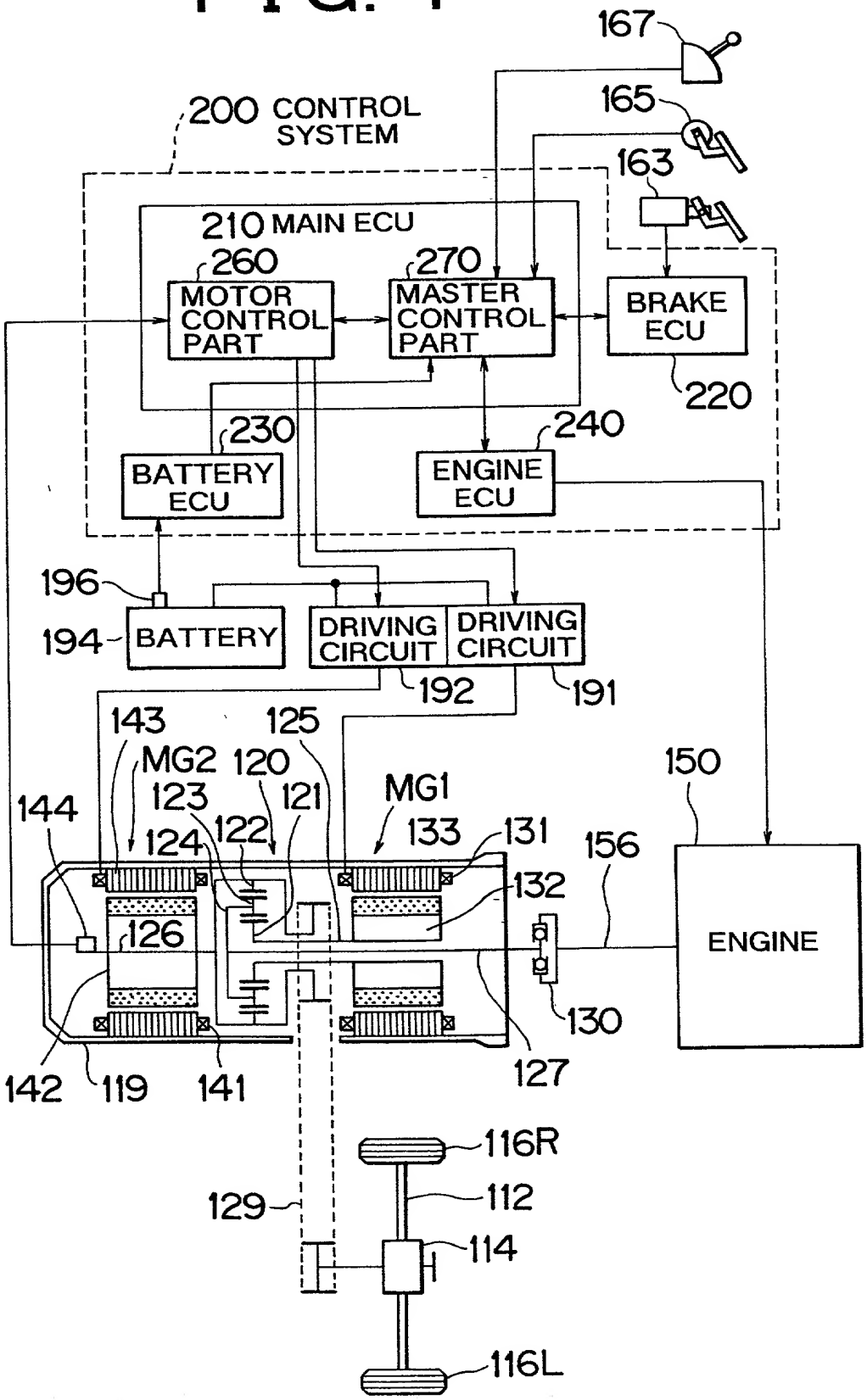


FIG. 2

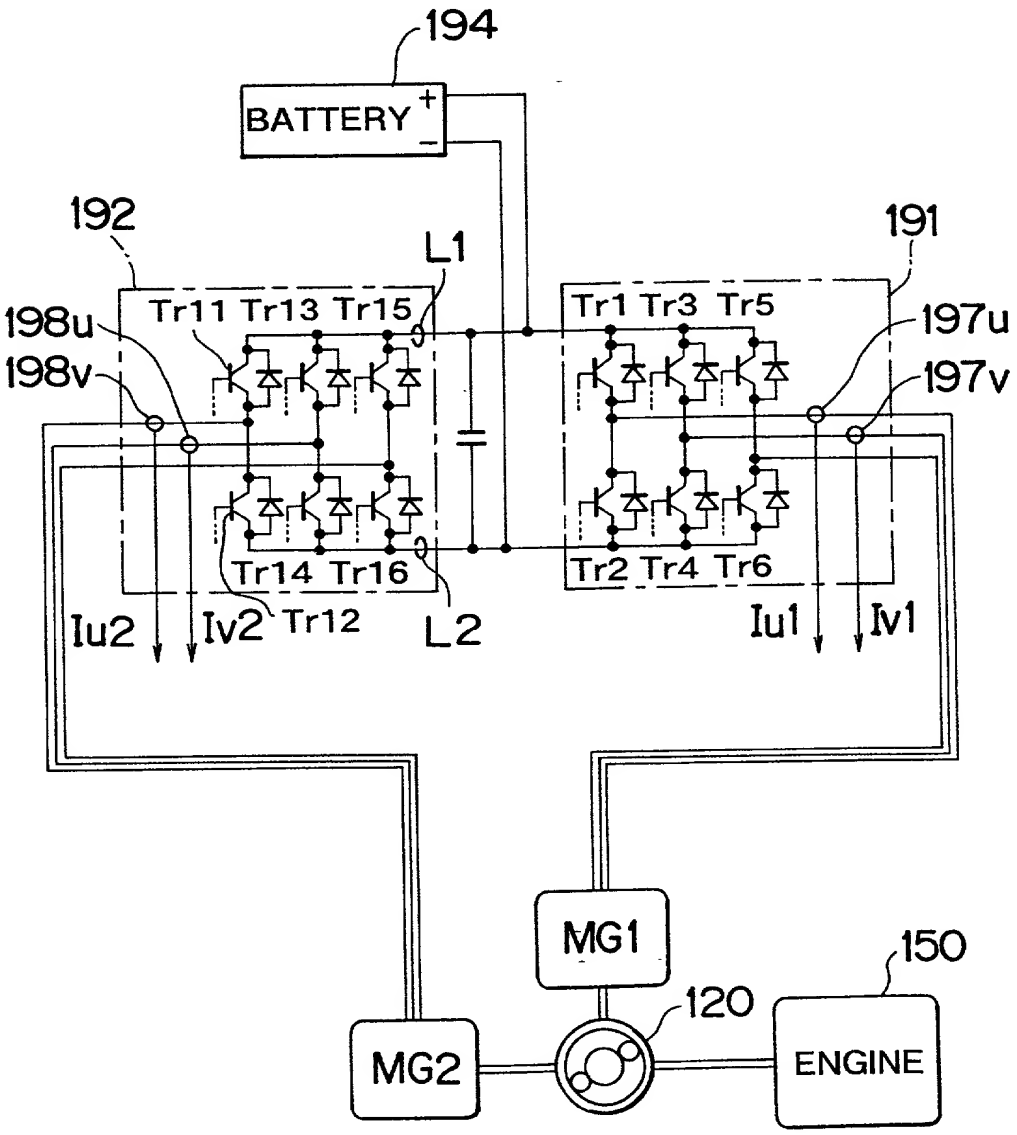

194
BATTERY
+
−
192
191
L1
198u
198v
Tr11 Tr13 Tr15
Tr1 Tr3 Tr5
197u
197v
Tr14 Tr16
Tr2 Tr4 Tr6
Iu2
Iv2
Tr12
L2
Iu1
Iv1
MG1
150
120
MG2
ENGINE

FIG. 3

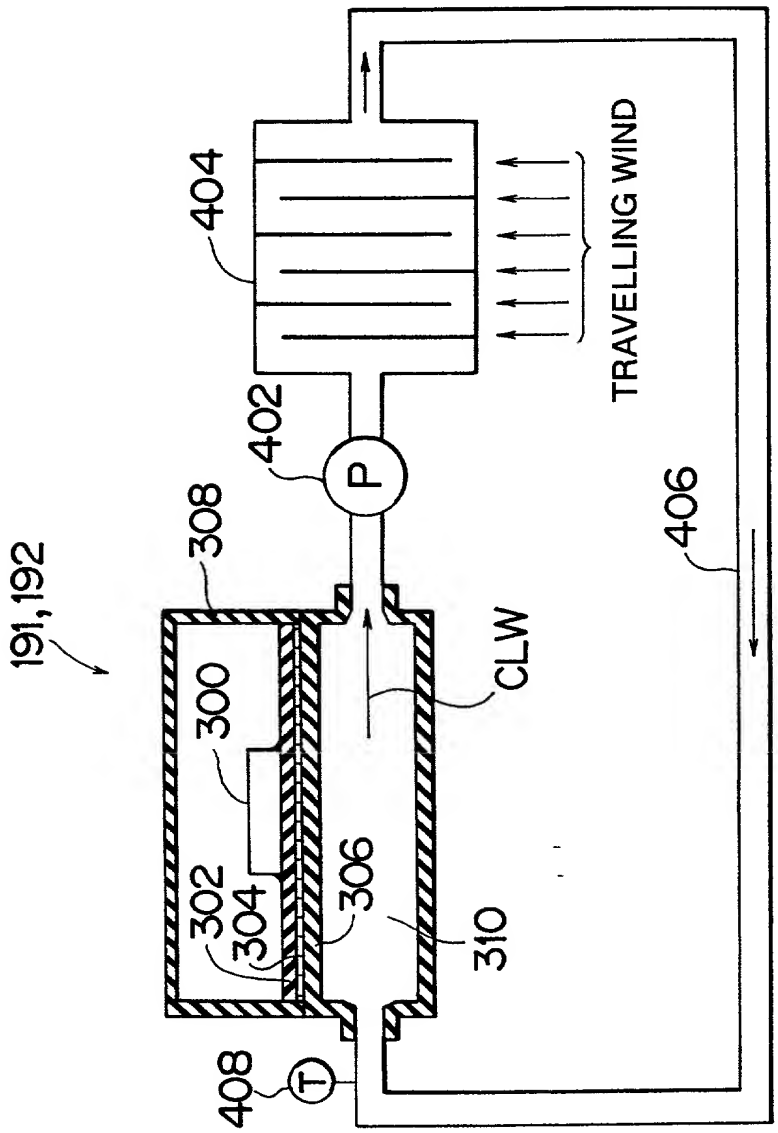

191,192
308
300
302
304
306
310
CLW
404
402
P
406
TRAVELLING WIND
408
T

FIG. 4

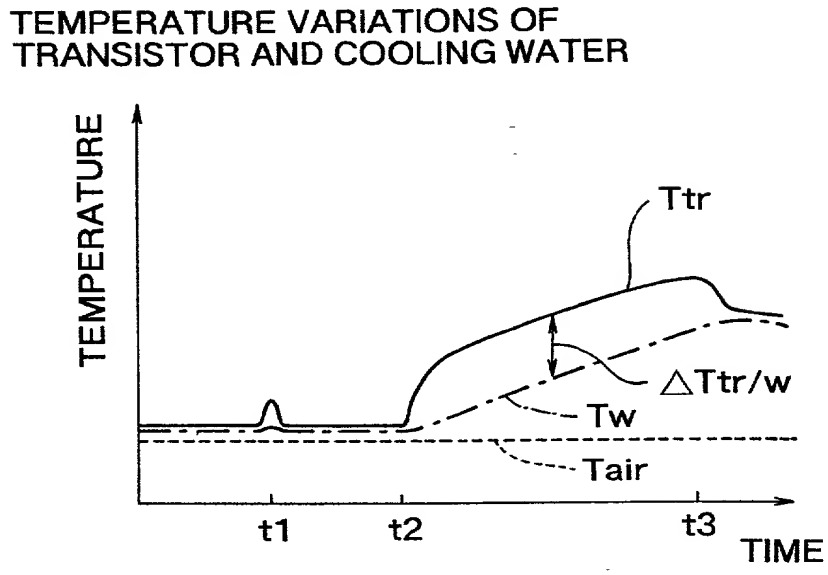

TEMPERATURE VARIATIONS OF
TRANSISTOR AND COOLING WATER
TEMPERATURE
Ttr
△Ttr/w
Tw
Tair
t1
t2
t3
TIME

FIG. 5

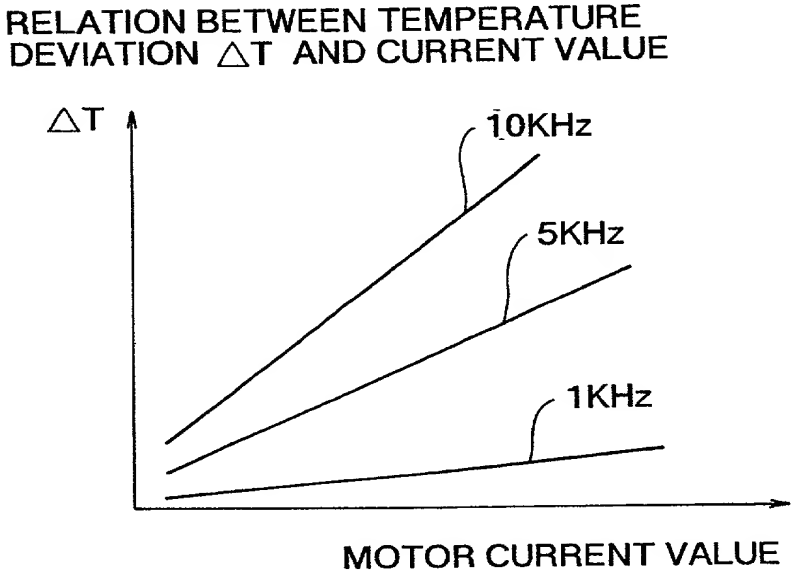

RELATION BETWEEN TEMPERATURE
DEVIATION △T AND CURRENT VALUE
△T
10KHz
5KHz
1KHz
MOTOR CURRENT VALUE

FIG. 6

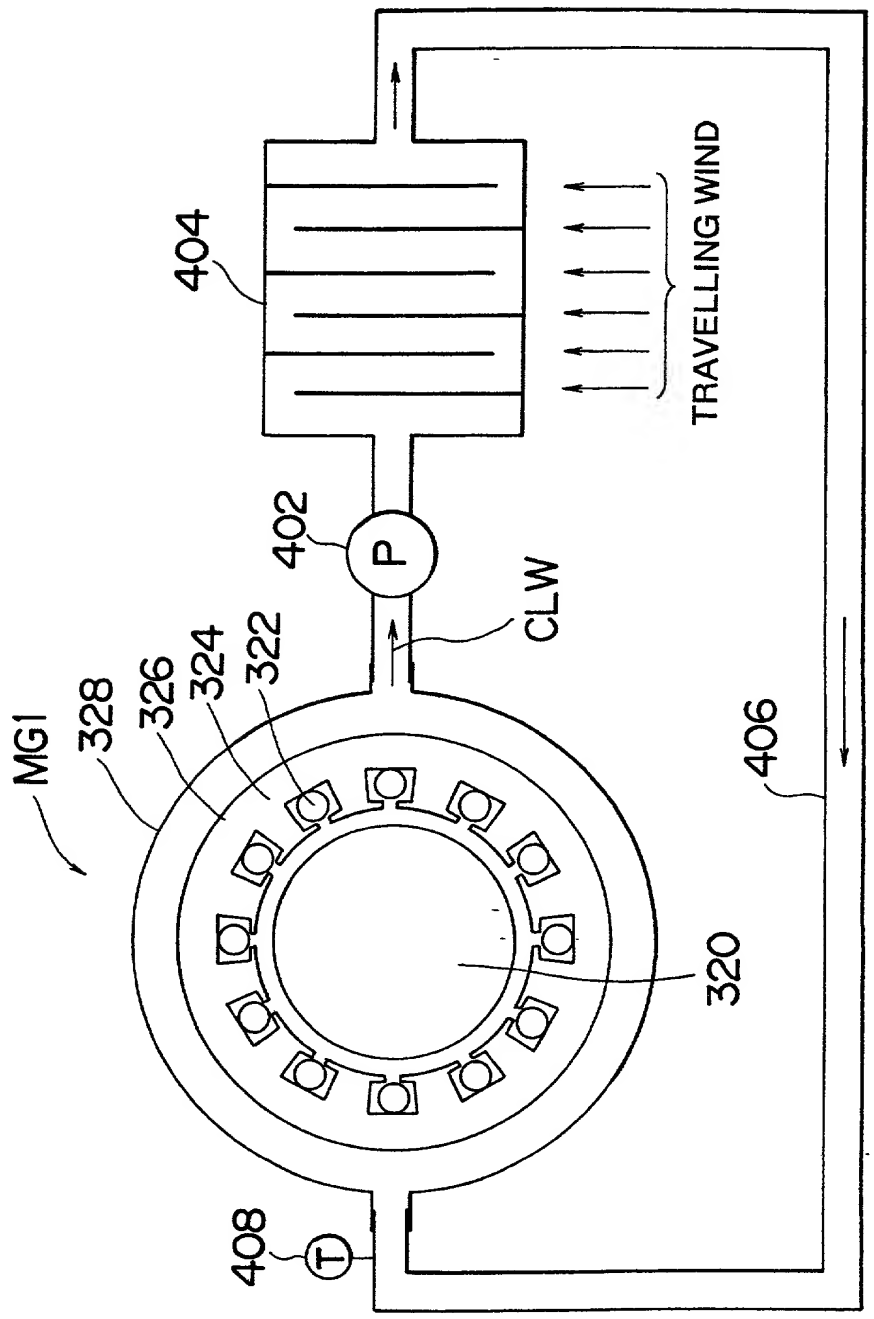


FIG. 7

TEMPERATURE VARIATIONS OF STATOR OF THE FIRST MOTOR MG1 AND COOLING WATER

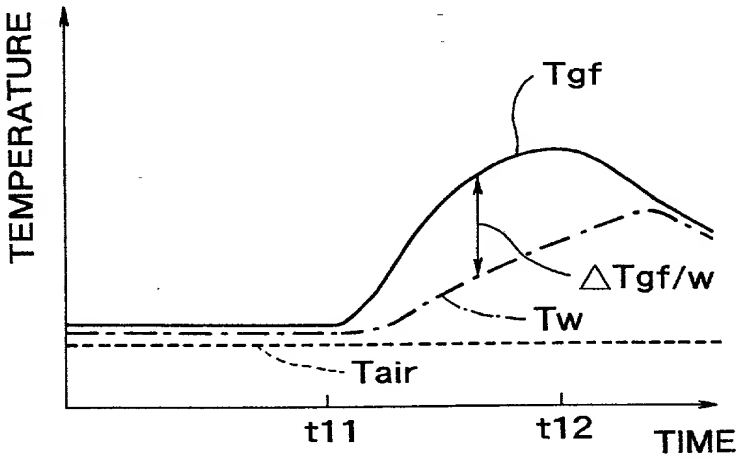


FIG. 8

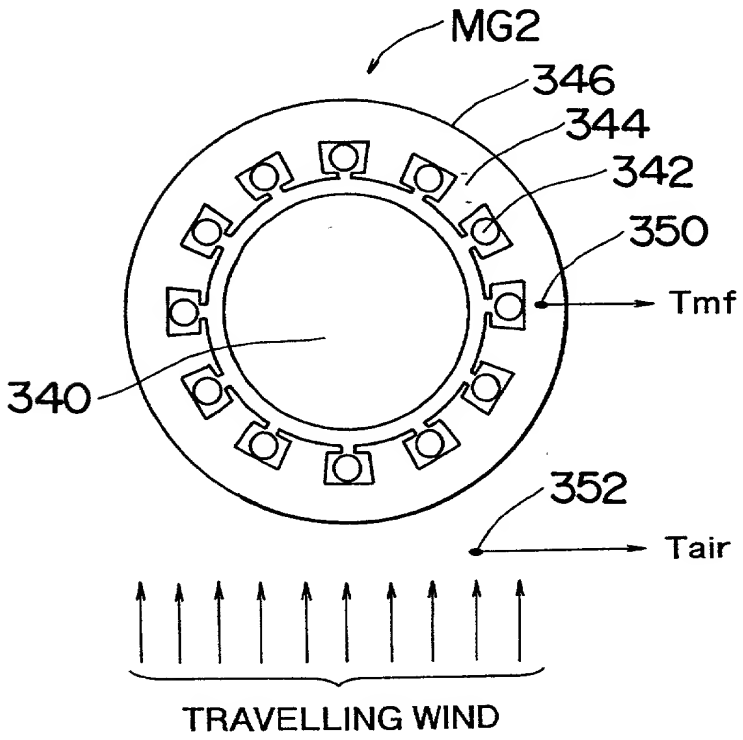


FIG. 9

TEMPERATURE VARIATIONS OF STATOR OF THE SECOND MOTOR MG2 AND COOLING WATER

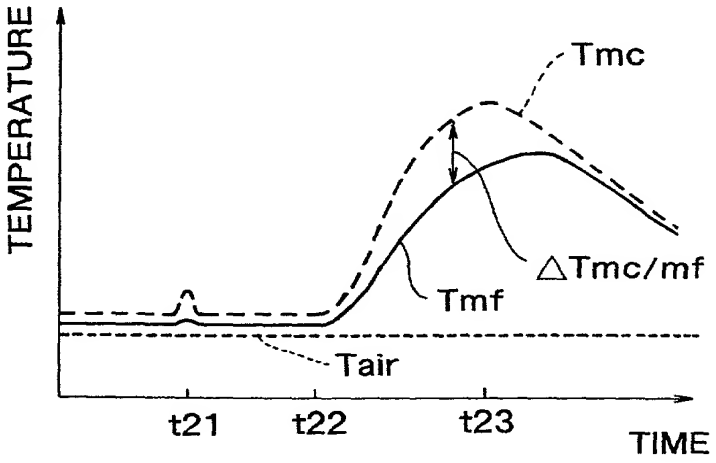


FIG. 10

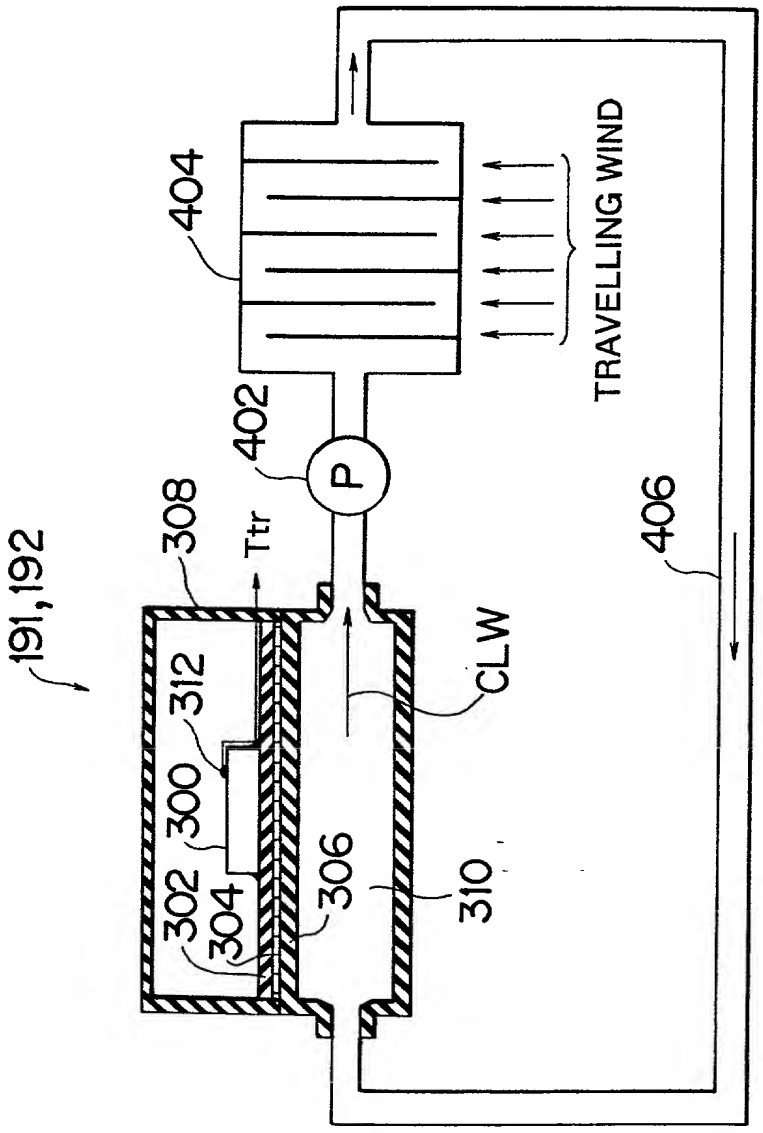
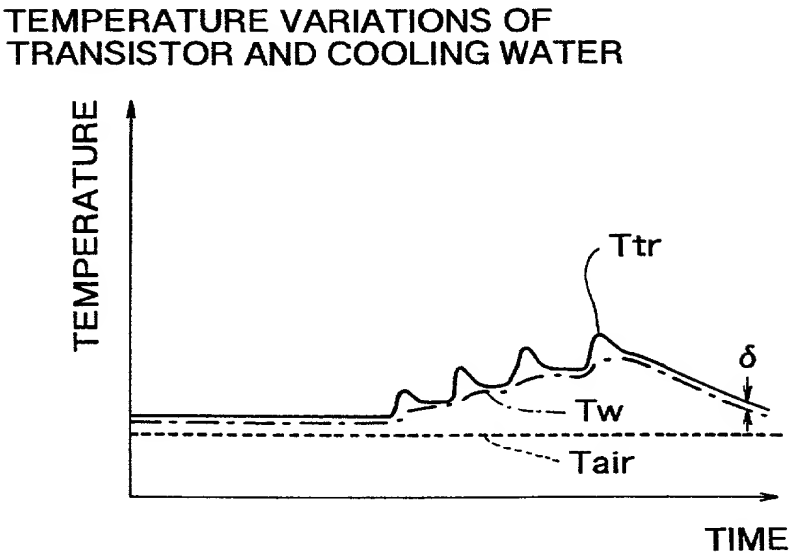

191,192
308
Ttr
312
300
302
304
306
310
CLW
402
P
404
TRAVELLING WIND
406

FIG. 11


TEMPERATURE VARIATIONS OF
TRANSISTOR AND COOLING WATER
TEMPERATURE
Ttr
δ
Tw
Tair
TIME

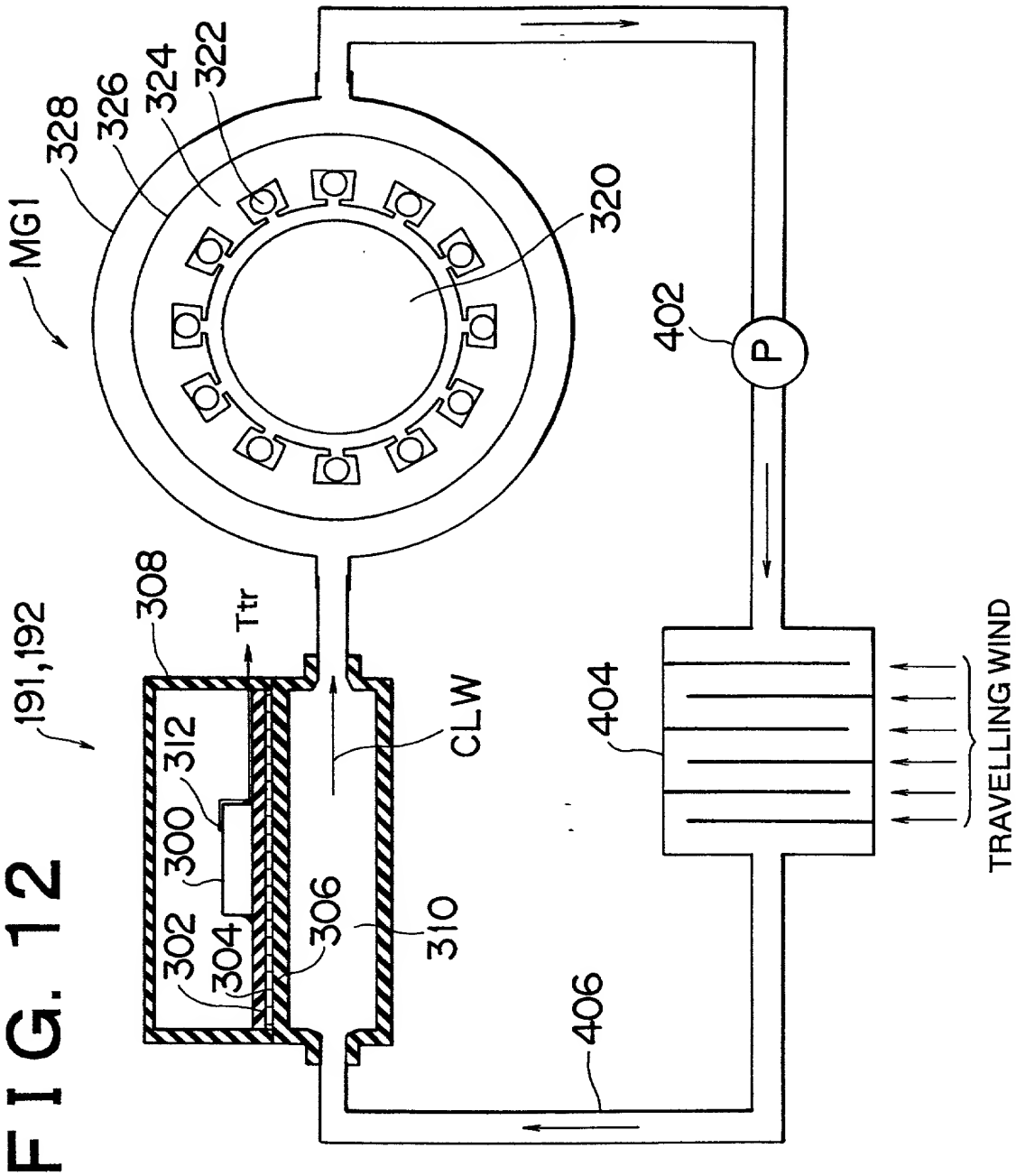
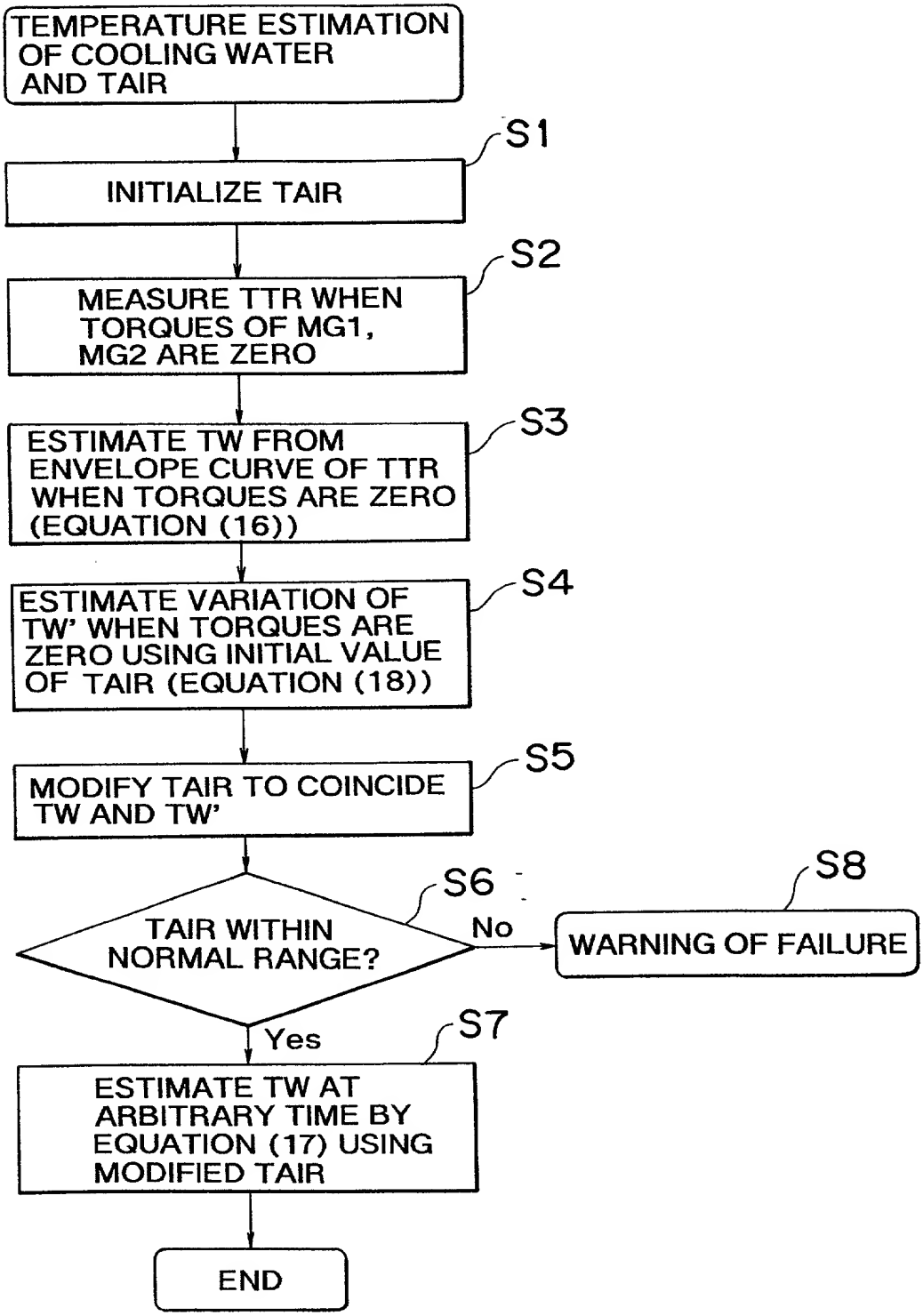

MG1
328
326
324
322
320
402
P
308
Ttr
191,192
312
300
302
304
306
310
CLW
404
406
TRAVELLING WIND

FIG. 12

FIG. 13


TEMPERATURE ESTIMATION OF COOLING WATER AND TAIR
S1
INITIALIZE TAIR
S2
MEASURE TTR WHEN TORQUES OF MG1, MG2 ARE ZERO
S3
ESTIMATE TW FROM ENVELOPE CURVE OF TTR WHEN TORQUES ARE ZERO (EQUATION (16))
S4
ESTIMATE VARIATION OF TW' WHEN TORQUES ARE ZERO USING INITIAL VALUE OF TAIR (EQUATION (18))
S5
MODIFY TAIR TO COINCIDE TW AND TW'
S6
TAIR WITHIN NORMAL RANGE?
No
S8
WARNING OF FAILURE
Yes
S7
ESTIMATE TW AT ARBITRARY TIME BY EQUATION (17) USING MODIFIED TAIR
END